



1258427 - R8 SDMS



**ESAT Region 8 Chain of Custody Form
U.S. Environmental Protection Agency
Region 8 Superfund Program**

Site Name: Rico - Argentine TDF: DC - 264

Site Manager: Steve Way Work Order: C 111002

Relinquished By:

Nick Philpot Nov 9, 2011 Nick Philpot
Print Name Date Signature

Received By:

Don Goodrich 11/9/11 Don Goodrich
Print Name Date Signature

Relinquished By:

Print Name Date Signature

Received By:

Print Name Date Signature

Relinquished By:

Print Name Date Signature

Received By:

Print Name Date Signature



TechLaw, Inc.
Environmental Services Assistance Team
16194 W. 45th Drive, Golden, CO 80403
(303) 312-7708

Task Order: 40 - Analytical Spt & Data Validation (Non-Libby)
DCN#: EP8 - 6 - 6537
Contract: EP-W-06-33
TDF#: D264
Line Item: All
TDF Status: Complete
Date: 11/8/2011
To: Don Goodrich, USEPA, Region 8 ESAT Task Order Project Officer
From: Scout DellaMia, ESAT Environmental Scientist
Through: Mark McDaniel, Region 8 ESAT Team Manager
Subject: Rico-Argentine_SW_OCT_2011 (C111002)

Comments:

10/11/2011 Received 15 Water Samples for the following analyses:

WC - Anions by Ion Chromatography 2010
Total Recoverable Metals by ICP-OE
Total Recoverable Metals by ICP-MS
Dissolved Metals / Hardness by ICP-OE
Dissolved Metals ICP-MS

Thank You

Deliverable Submission and Evaluation Form

EPA Region 8 ESAT

Contractor: TechLaw

Updated: 05/05/11

Contract No: EP-W-06-33

Submission Information (to be completed by ESAT):

Task Order: 40 - Analytical Spt & Data Validation (Non-Libby)				
DCN: EP8 -6 - 6537				
TDF:	D264	Line Item:	All	TDF Status:
Complete				
Submission Date: 11/8/2011				
Submitted By: Scout DellaMia, ESAT Environmental Scientist				
Deliverable Description:				
Rico-Argentine_SW_OCT_2011 (C111002)				
Submitter Comments:				
Hardcopy Data Report and Hardcopy Raw Data + CD-ROM with Data Report .pdf, Scribe EXCEL EDD, and Raw Data .pdf				

Evaluation Information (to be completed by EPA):

Review Date:	11-15-2011			
Reviewed by:	Jeanne MacDonald			
Evaluation:	<input checked="" type="checkbox"/> This deliverable is considered acceptable. <input type="checkbox"/> This deliverable requires revisions as noted below or per attached.			
Evaluation Comments:				
completeness date 11-15-2011				



U.S. Environmental Protection Agency
Region 8
Technical and Management Services

Laboratory Services Program

Certificate of Analysis

Ref: 8TMS-L

MEMORANDUM

Date: 11/02/11

Subject: Analytical Results--- **Rico-Argentine_Surface Waters_OCT 2011_D264 / DG-264**

From: Don Goodrich; EPA Region 8 Analytical Chemistry WAM

To: Steve Way
Superfund
1595 Wynkoop Street

Received Sample Set(s), [Work Order : Date Received]:

[C111002 : 10/11/2011]

Attached are the analytical results for the samples received from the Rico-Argentine_Surface Waters_OCT 2011_D264 sampling event, according to TDF DG-264. All analyses were performed within their method specified holding times unless otherwise noted in the following narrative.

These samples were prepared, analyzed, and verified by the Environmental Services Assistance Team Laboratory (ESAT) according to the requirements of the Technical Direction Form (TDF).

Note: The laboratory herewith transmits this deliverable to the program/project partner for determination of "final data usability" which may include data validation and data quality assessment per and in accordance with EPA QA/G-8, *Guidance on Environmental Data Verification and Data Validation*, November 2002, EPA/240/R-02/004. Laboratory data qualifiers are applied based on the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004, referred to as "NFGI".

Case Narrative**C111002**

Quality Assessment: Unless indicated by exception, the QA/QC associated with this sample set produced data within the TDF-specified criteria.

Holding Times: All samples were analyzed within their method-specified technical holding time(s).

1. Initial and Continuing calibration blanks (ICBs and CCBs).
Exceptions: None.
2. Preparation (PB) / Method blanks (MB)
Exceptions: In ICP-MS batch 1110070, cadmium was detected in the prep blank at a level less than twice the PQL. As a result, the reporting limit for cadmium was raised to 0.30 ug/L. No qualifiers were assigned.
3. Interference Checks (ICSA / ICSAB) for ICP-MS and ICP-OE analyses only.
Exceptions: None.
4. Initial and Continuing calibration verification analyses (ICVs and CCVs).
Exceptions: None.
5. Laboratory Control Sample (LCS) or second source analysis or SRM.
Exceptions: None.
6. Laboratory Fortified blank (LFB) / Blank spike (BS), same source as used for the matrix spikes.
PBS performed with analyses/methods requiring preparation or digestion prior to analysis.
Exceptions: None.
7. Contract Reporting Detection Limit Standard, labeled as CRA, CRDL or CRL.
Exceptions: None.
8. Laboratory Duplicate (DUP). "Source" identifies field sample duplicated in the laboratory. If either the "source" or the duplicate result is <5X the reporting limit, the %D limit of 20% does not apply.
Exceptions: None.
9. Laboratory Matrix Spike (MS) and spike duplicate (MSD). "Source" defines original field sample fortified prior to analysis. Percent recovery (%R) limits do not apply when sample concentration(s) exceed the corresponding analyte spike level by a factor of 4 or greater.
Exceptions: None.
10. Serial Dilution sample analysis (SRD). "Source" is parent field sample diluted 1:5 in the laboratory. Performed for ICP-OE and ICP-MS metals analyses. Percent difference (%D) limits do not apply when analyte concentration(s) are below 50x the source sample's MDL (or 10x it's PQL).
Exceptions: None.
11. Internal standards, criteria specified for ICP-MS analyses only, monitored at the instrument.
Exceptions: None.
12. Any calibration using more than two-points produced a correlation coefficient equal to or greater than 0.995.
Exceptions: None.

Acronyms and Definitions:

ESAT	Environmental Services Assistance Team
J	Data Estimated qualifier (also applied to all data less than PQL, greater than or equal to MDL)
MDL	Method Detection Limit
PQL	Practical Quantitation Limit, also known as reporting limit.
RPD	Relative Percent Difference (difference divided by the mean)
%D	Percent difference, serial dilution criteria unit, difference divided by the original result.
%R	Percent recovery, analyzed (less sample contribution) divided by true value
<	Analyte NOT DETECTED at or above the Method Detection Limit (MDL)
mg/L	Parts per million (milligrams per liter). Solids equivalent = mg/Kg.
ug/L	Parts per billion (micrograms per liter). Solids equivalent = ug/Kg.
NR	No Recovery (matrix spike) - Often seen for calcium/magnesium when their concentration exceeds the spike level by > 4x.
NFGI	USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004
RE	Sample Re-analysis. Usually seen on raw data and sequences for required sample dilutions due to over-range analytes.

Method(s) Summary:

As defined in the Technical Direction Form (TDF), some or all of the methods listed below were used for the determination of the reported target analytes.

From EPA's *Methods for the Determination of Metals in Environmental Samples*, Supplement I, May 1994, dissolved, total, and/or total recoverable metals were determined by:

- Method 200.7 / 6010B using a PE Optima ICP-OE (ICP).
- Method 200.8 / 6020 using a Perkin-Elmer Elan 6000 ICP-MS.
- Method 200.2 for total recoverable metals (only) digestion.
- Method 245.1 using a Perkin-Elmer FIMS CVAA (aqueous mercury only).

From *Standard Methods for the Examination of Water and Wastewater*, 18th Edition, 1992, Method 2340B was used for the calculated hardness determination. Hardness is reported as mg (milligram) equivalent CaCO₃ per liter (L) determined as follows:

$$\text{Calculated hardness} = 2.497 * (\text{Calcium, mg/L}) + 4.118 * (\text{Magnesium, mg/L}).$$

From EPA's *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846,

- Method 3015A was used for microwave assisted total metals digestion.
- Method 7473 was used for mercury in solids.

From EPA's *Determination of Inorganic Anions by Ion Chromatography*, Revision 2.1, 1993, Method 300.0 was used to determine the anions.

From EPA's *Methods for Chemical Analysis of Water and Wastes*, March 1983:

- Method 310.1 was followed for the alkalinity determination.
- Method 160.1 was followed for gravimetric total dissolved solids (TDS) determination.
- Method 160.2 was used for gravimetric total suspended solids (TSS) determination.
- Method 415.3 was used for total organic carbon (TOC) determination using either an Apollo 9000 or Phoenix 8000 Non-Dispersive IR (NDIR) system. Also known as dissolved organic carbon (DOC) when performed on the dissolved sample fraction.

The quality control procedures listed in the TDF request were utilized by ESAT to verify accuracy of the results and to evaluate any matrix interferences.

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264

Certificate of Analysis

TDF #: DG-264

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID:	ArgentineShaft455_100311	Date / Time Sampled:	10/03/11 15:25	Workorder:	C111002
EPA Tag No.:	8-B	Matrix:	Water	Lab Number:	C111002-01 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	28100		ug/L	20.0	1	10/25/2011	SW	1110087
200.7	Calcium	436000		ug/L	100	1	10/25/2011	SW	1110087
200.7	Iron	81700		ug/L	100	1	10/25/2011	SW	1110087
200.7	Magnesium	73200		ug/L	100	1	10/25/2011	SW	1110087
200.7	Manganese	23300		ug/L	2.00	1	10/25/2011	SW	1110087
200.7	Potassium	1430		ug/L	250	1	10/25/2011	SW	1110087
200.7	Sodium	4680		ug/L	250	1	10/25/2011	SW	1110087
200.7	Zinc	67700		ug/L	10.0	1	10/25/2011	SW	1110087
200.8	Antimony	< 10.0	U	ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Arsenic	< 20.0	U	ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Barium	< 100	U	ug/L	50.0	10	10/25/2011	SW	1110088
200.8	Beryllium	4.63		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Cadmium	399		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Chromium	38.5		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Cobalt	37.1		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Copper	2700		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Lead	429		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Molybdenum	2.60		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Nickel	73.5		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Selenium	13.2		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Silver	6.82	J	ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Thallium	< 10.0	U	ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Vanadium	< 20.0	U	ug/L	10.0	10	10/25/2011	SW	1110088
2340B	Hardness	1390		mg/L	2	1	10/25/2011	SW	1110087

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264

Certificate of Analysis

TDF #: DG-264

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID:	ArgentineShaft475_100311	Date / Time Sampled:	10/03/11 15:55	Workorder:	C111002				
EPA Tag No.:	8-B	Matrix:	Water	Lab Number:	C111002-03 A				
Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	27600		ug/L	20.0	1	10/25/2011	SW	1110087
200.7	Calcium	424000		ug/L	100	1	10/25/2011	SW	1110087
200.7	Iron	75300		ug/L	100	1	10/25/2011	SW	1110087
200.7	Magnesium	70400		ug/L	100	1	10/25/2011	SW	1110087
200.7	Manganese	23400		ug/L	2.00	1	10/25/2011	SW	1110087
200.7	Potassium	1280		ug/L	250	1	10/25/2011	SW	1110087
200.7	Sodium	4470		ug/L	250	1	10/25/2011	SW	1110087
200.7	Zinc	67500		ug/L	10.0	1	10/25/2011	SW	1110087
200.8	Antimony	< 10.0	U	ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Arsenic	< 20.0	U	ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Barium	< 100	U	ug/L	50.0	10	10/25/2011	SW	1110088
200.8	Beryllium	4.26		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Cadmium	390		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Chromium	26.5		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Cobalt	36.9		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Copper	2810		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Lead	435		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Molybdenum	< 2.00	U	ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Nickel	73.3		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Selenium	8.77	J	ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Silver	< 10.0	U	ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Thallium	< 10.0	U	ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Vanadium	< 20.0	U	ug/L	10.0	10	10/25/2011	SW	1110088
2340B	Hardness	1350		mg/L	2	1	10/25/2011	SW	1110087

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264

Certificate of Analysis

TDF #: DG-264

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID:	BlaineInflow1_100611	Date / Time Sampled:	10/06/11 14:30	Workorder:	C111002
EPA Tag No.:	8-B	Matrix:	Water	Lab Number:	C111002-05 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	303000		ug/L	200	10	10/25/2011	SW	1110087
200.7	Calcium	389000		ug/L	1000	10	10/25/2011	SW	1110087
200.7	Iron	2190000		ug/L	1000	10	10/25/2011	SW	1110087
200.7	Magnesium	229000		ug/L	1000	10	10/25/2011	SW	1110087
200.7	Manganese	115000		ug/L	20.0	10	10/25/2011	SW	1110087
200.7	Potassium	22100		ug/L	2500	10	10/25/2011	SW	1110087
200.7	Sodium	5000		ug/L	2500	10	10/25/2011	SW	1110087
200.7	Zinc	199000		ug/L	100	10	10/25/2011	SW	1110087
200.8	Antimony	< 10.0	U	ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Arsenic	51.7		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Barium	< 100	U	ug/L	50.0	10	10/25/2011	SW	1110088
200.8	Beryllium	20.6		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Cadmium	1180		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Chromium	225		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Cobalt	242		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Copper	30300		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Lead	290		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Molybdenum	7.55		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Nickel	420		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Selenium	43.6		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Silver	< 10.0	U	ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Thallium	5.61	J	ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Vanadium	390		ug/L	10.0	10	10/25/2011	SW	1110088
2340B	Hardness	1920		mg/L	15	10	10/25/2011	SW	1110087

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264

Certificate of Analysis

TDF #:

DG-264

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID: BlaineTunnel_100311
EPA Tag No.: 8-BDate / Time Sampled: 10/03/11 16:30
Matrix: WaterWorkorder: C111002
Lab Number: C111002-08 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	124000		ug/L	200	10	10/25/2011	SW	1110087
200.7	Calcium	366000		ug/L	1000	10	10/25/2011	SW	1110087
200.7	Iron	1390000		ug/L	1000	10	10/25/2011	SW	1110087
200.7	Magnesium	138000		ug/L	1000	10	10/25/2011	SW	1110087
200.7	Manganese	61600		ug/L	20.0	10	10/25/2011	SW	1110087
200.7	Potassium	7010	J	ug/L	2500	10	10/25/2011	SW	1110087
200.7	Sodium	4650	J	ug/L	2500	10	10/25/2011	SW	1110087
200.7	Zinc	161000		ug/L	100	10	10/25/2011	SW	1110087
200.8	Antimony	< 10.0	U	ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Arsenic	1190		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Barium	< 100	U	ug/L	50.0	10	10/25/2011	SW	1110088
200.8	Beryllium	16.1		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Cadmium	953		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Chromium	105		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Cobalt	152		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Copper	15800		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Lead	404		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Molybdenum	19.0		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Nickel	214		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Selenium	35.3		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Silver	< 10.0	U	ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Thallium	< 10.0	U	ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Vanadium	172		ug/L	10.0	10	10/25/2011	SW	1110088
2340B	Hardness	1480		mg/L	15	10	10/25/2011	SW	1110087

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264

Certificate of Analysis

TDF #: DG-264

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID: BTD_100311 EPA Tag No.: 8-B		Date / Time Sampled: Matrix: Water		10/03/11 14:30		Workorder: C111002 Lab Number: C111002-11 A			
Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	123000		ug/L	200	10	10/25/2011	SW	1110087
200.7	Calcium	365000		ug/L	1000	10	10/25/2011	SW	1110087
200.7	Iron	1390000		ug/L	1000	10	10/25/2011	SW	1110087
200.7	Magnesium	137000		ug/L	1000	10	10/25/2011	SW	1110087
200.7	Manganese	61700		ug/L	20.0	10	10/25/2011	SW	1110087
200.7	Potassium	6840	J	ug/L	2500	10	10/25/2011	SW	1110087
200.7	Sodium	4640	J	ug/L	2500	10	10/25/2011	SW	1110087
200.7	Zinc	162000		ug/L	100	10	10/25/2011	SW	1110087
200.8	Antimony	< 10.0	U	ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Arsenic	1200		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Barium	< 100	U	ug/L	50.0	10	10/25/2011	SW	1110088
200.8	Beryllium	13.7		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Cadmium	967		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Chromium	103		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Cobalt	155		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Copper	15600		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Lead	397		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Molybdenum	19.5		ug/L	1.00	10	10/25/2011	SW	1110088
200.8	Nickel	208		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Selenium	33.2		ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Silver	< 10.0	U	ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Thallium	< 10.0	U	ug/L	5.00	10	10/25/2011	SW	1110088
200.8	Vanadium	169		ug/L	10.0	10	10/25/2011	SW	1110088
2340B	Hardness	1480		mg/L	15	10	10/25/2011	SW	1110087

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264

Certificate of Analysis

TDF #: DG-264

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID: SC068_100711
EPA Tag No.: 8-BDate / Time Sampled: 10/07/11 09:20
Matrix: Surface WaterWorkorder: C111002
Lab Number: C111002-14 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	40.8	J	ug/L	20.0	1	10/25/2011	SW	1110087
200.7	Calcium	36100		ug/L	100	1	10/25/2011	SW	1110087
200.7	Iron	< 250	U	ug/L	100	1	10/25/2011	SW	1110087
200.7	Magnesium	3630		ug/L	100	1	10/25/2011	SW	1110087
200.7	Manganese	3.77	J	ug/L	2.00	1	10/25/2011	SW	1110087
200.7	Potassium	578	J	ug/L	250	1	10/25/2011	SW	1110087
200.7	Sodium	3670		ug/L	250	1	10/25/2011	SW	1110087
200.7	Zinc	< 20.0	U	ug/L	10.0	1	10/25/2011	SW	1110087
200.8	Antimony	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Arsenic	13.6		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Barium	121		ug/L	5.00	1	10/25/2011	SW	1110088
200.8	Beryllium	< 0.200	U	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Cadmium	< 0.200	U	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Chromium	3.46		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Cobalt	< 0.200	U	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Copper	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Lead	0.221		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Molybdenum	0.509		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Nickel	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Selenium	60.3		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Silver	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Thallium	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Vanadium	1.13	J	ug/L	1.00	1	10/25/2011	SW	1110088
2340B	Hardness	105		mg/L	2	1	10/25/2011	SW	1110087

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264

Certificate of Analysis

TDF #: DG-264

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID: SC068D_100711
EPA Tag No.: 8-BDate / Time Sampled: 10/07/11 09:20
Matrix: WaterWorkorder: C111002
Lab Number: C111002-17 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	25.6	J	ug/L	20.0	1	10/25/2011	SW	1110087
200.7	Calcium	36700		ug/L	100	1	10/25/2011	SW	1110087
200.7	Iron	< 250	U	ug/L	100	1	10/25/2011	SW	1110087
200.7	Magnesium	3690		ug/L	100	1	10/25/2011	SW	1110087
200.7	Manganese	6.74		ug/L	2.00	1	10/25/2011	SW	1110087
200.7	Potassium	589	J	ug/L	250	1	10/25/2011	SW	1110087
200.7	Sodium	3730		ug/L	250	1	10/25/2011	SW	1110087
200.7	Zinc	24.8		ug/L	10.0	1	10/25/2011	SW	1110087
200.8	Antimony	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Arsenic	12.8		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Barium	122		ug/L	5.00	1	10/25/2011	SW	1110088
200.8	Beryllium	< 0.200	U	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Cadmium	< 0.200	U	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Chromium	3.21		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Cobalt	< 0.200	U	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Copper	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Lead	0.107	J	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Molybdenum	0.519		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Nickel	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Selenium	56.7		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Silver	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Thallium	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Vanadium	1.12	J	ug/L	1.00	1	10/25/2011	SW	1110088
2340B	Hardness	107		mg/L	2	1	10/25/2011	SW	1110087

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264

Certificate of Analysis

TDF #: DG-264

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID: SC1094_100711	Date / Time Sampled: 10/07/11 09:26	Workorder: C111002
EPA Tag No.: 8-B	Matrix: Surface Water	Lab Number: C111002-20 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	63.5		ug/L	20.0	1	10/25/2011	SW	1110087
200.7	Calcium	320000		ug/L	100	1	10/25/2011	SW	1110087
200.7	Iron	< 250	U	ug/L	100	1	10/25/2011	SW	1110087
200.7	Magnesium	55400		ug/L	100	1	10/25/2011	SW	1110087
200.7	Manganese	3950		ug/L	2.00	1	10/25/2011	SW	1110087
200.7	Potassium	2920		ug/L	250	1	10/25/2011	SW	1110087
200.7	Sodium	2410		ug/L	250	1	10/25/2011	SW	1110087
200.7	Zinc	3780		ug/L	10.0	1	10/25/2011	SW	1110087
200.8	Antimony	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Arsenic	< 2.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Barium	7.65	J	ug/L	5.00	1	10/25/2011	SW	1110088
200.8	Beryllium	< 0.200	U	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Cadmium	0.553		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Chromium	5.06		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Cobalt	< 0.200	U	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Copper	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Lead	< 0.200	U	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Molybdenum	0.607		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Nickel	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Selenium	0.943	J	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Silver	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Thallium	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Vanadium	1.36	J	ug/L	1.00	1	10/25/2011	SW	1110088
2340B	Hardness	1030		mg/L	2	1	10/25/2011	SW	1110087

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264

Certificate of Analysis

TDF #: DG-264

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID:	SC1131_100711	Date / Time Sampled:	10/07/11 09:25	Workorder:	C111002
EPA Tag No.:	8-B	Matrix:	Surface Water	Lab Number:	C111002-23 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	43.0	J	ug/L	20.0	1	10/25/2011	SW	1110087
200.7	Calcium	51300		ug/L	100	1	10/25/2011	SW	1110087
200.7	Iron	< 250	U	ug/L	100	1	10/25/2011	SW	1110087
200.7	Magnesium	6240		ug/L	100	1	10/25/2011	SW	1110087
200.7	Manganese	128		ug/L	2.00	1	10/25/2011	SW	1110087
200.7	Potassium	682	J	ug/L	250	1	10/25/2011	SW	1110087
200.7	Sodium	3020		ug/L	250	1	10/25/2011	SW	1110087
200.7	Zinc	570		ug/L	10.0	1	10/25/2011	SW	1110087
200.8	Antimony	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Arsenic	8.91		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Barium	103		ug/L	5.00	1	10/25/2011	SW	1110088
200.8	Beryllium	< 0.200	U	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Cadmium	1.92		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Chromium	3.46		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Cobalt	< 0.200	U	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Copper	0.980	J	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Lead	1.02		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Molybdenum	0.529		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Nickel	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Selenium	40.1		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Silver	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Thallium	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Vanadium	1.03	J	ug/L	1.00	1	10/25/2011	SW	1110088
2340B	Hardness	154		mg/L	2	1	10/25/2011	SW	1110087

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264

Certificate of Analysis

TDF #: DG-264

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID: SC198_100711 EPA Tag No.: 8-B		Date / Time Sampled: 10/07/11 09:10 Matrix: Surface Water			Workorder: C111002 Lab Number: C111002-26 A				
Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	35.0	J	ug/L	20.0	1	10/25/2011	SW	1110087
200.7	Calcium	38000		ug/L	100	1	10/25/2011	SW	1110087
200.7	Iron	< 250	U	ug/L	100	1	10/25/2011	SW	1110087
200.7	Magnesium	3910		ug/L	100	1	10/25/2011	SW	1110087
200.7	Manganese	3.54	J	ug/L	2.00	1	10/25/2011	SW	1110087
200.7	Potassium	594	J	ug/L	250	1	10/25/2011	SW	1110087
200.7	Sodium	3570		ug/L	250	1	10/25/2011	SW	1110087
200.7	Zinc	94.5		ug/L	10.0	1	10/25/2011	SW	1110087
200.8	Antimony	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Arsenic	12.8		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Barium	121		ug/L	5.00	1	10/25/2011	SW	1110088
200.8	Beryllium	< 0.200	U	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Cadmium	0.217		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Chromium	3.24		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Cobalt	< 0.200	U	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Copper	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Lead	0.123	J	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Molybdenum	0.513		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Nickel	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Selenium	56.7		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Silver	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Thallium	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Vanadium	1.10	J	ug/L	1.00	1	10/25/2011	SW	1110088
2340B	Hardness	111		mg/L	2	1	10/25/2011	SW	1110087

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264

Certificate of Analysis

TDF #: DG-264

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID:	SC275_100711	Date / Time Sampled:	10/07/11 09:20	Workorder:	C111002
EPA Tag No.:	8-B	Matrix:	Surface Water	Lab Number:	C111002-29 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	33.5	J	ug/L	20.0	1	10/25/2011	SW	1110087
200.7	Calcium	38600		ug/L	100	1	10/25/2011	SW	1110087
200.7	Iron	< 250	U	ug/L	100	1	10/25/2011	SW	1110087
200.7	Magnesium	4270		ug/L	100	1	10/25/2011	SW	1110087
200.7	Manganese	11.0		ug/L	2.00	1	10/25/2011	SW	1110087
200.7	Potassium	592	J	ug/L	250	1	10/25/2011	SW	1110087
200.7	Sodium	3490		ug/L	250	1	10/25/2011	SW	1110087
200.7	Zinc	307		ug/L	10.0	1	10/25/2011	SW	1110087
200.8	Antimony	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Arsenic	12.1		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Barium	122		ug/L	5.00	1	10/25/2011	SW	1110088
200.8	Beryllium	< 0.200	U	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Cadmium	1.22		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Chromium	3.26		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Cobalt	< 0.200	U	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Copper	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Lead	0.432		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Molybdenum	0.493		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Nickel	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Selenium	53.5		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Silver	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Thallium	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Vanadium	1.06	J	ug/L	1.00	1	10/25/2011	SW	1110088
2340B	Hardness	114		mg/L	2	1	10/25/2011	SW	1110087

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264

Certificate of Analysis

TDF #: DG-264

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID:	SC351_100711	Date / Time Sampled:	10/07/11 09:10	Workorder:	C111002
EPA Tag No.:	8-B	Matrix:	Surface Water	Lab Number:	C111002-32 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	42.7	J	ug/L	20.0	1	10/25/2011	SW	1110087
200.7	Calcium	39200		ug/L	100	1	10/25/2011	SW	1110087
200.7	Iron	< 250	U	ug/L	100	1	10/25/2011	SW	1110087
200.7	Magnesium	4330		ug/L	100	1	10/25/2011	SW	1110087
200.7	Manganese	24.5		ug/L	2.00	1	10/25/2011	SW	1110087
200.7	Potassium	591	J	ug/L	250	1	10/25/2011	SW	1110087
200.7	Sodium	3470		ug/L	250	1	10/25/2011	SW	1110087
200.7	Zinc	359		ug/L	10.0	1	10/25/2011	SW	1110087
200.8	Antimony	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Arsenic	12.1		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Barium	121		ug/L	5.00	1	10/25/2011	SW	1110088
200.8	Beryllium	< 0.200	U	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Cadmium	1.53		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Chromium	3.37		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Cobalt	< 0.200	U	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Copper	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Lead	1.80		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Molybdenum	0.517		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Nickel	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Selenium	53.8		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Silver	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Thallium	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Vanadium	1.08	J	ug/L	1.00	1	10/25/2011	SW	1110088
2340B	Hardness	116		mg/L	2	1	10/25/2011	SW	1110087

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264

Certificate of Analysis

TDF #: DG-264

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID:	SC404_100711	Date / Time Sampled:	10/07/11 09:13	Workorder:	C111002
EPA Tag No.:	8-B	Matrix:	Surface Water	Lab Number:	C111002-35 A
Method Parameter Results Qualifier Units MDL					
200.7	Aluminum	50.6		ug/L	20.0
200.7	Calcium	39300		ug/L	100
200.7	Iron	< 250	U	ug/L	100
200.7	Magnesium	4350		ug/L	100
200.7	Manganese	40.0		ug/L	2.00
200.7	Potassium	587	J	ug/L	250
200.7	Sodium	3500		ug/L	250
200.7	Zinc	382		ug/L	10.0
200.8	Antimony	< 1.00	U	ug/L	0.500
200.8	Arsenic	12.4		ug/L	0.500
200.8	Barium	120		ug/L	5.00
200.8	Beryllium	< 0.200	U	ug/L	0.100
200.8	Cadmium	1.68		ug/L	0.100
200.8	Chromium	2.84		ug/L	0.500
200.8	Cobalt	< 0.200	U	ug/L	0.100
200.8	Copper	0.813	J	ug/L	0.500
200.8	Lead	1.95		ug/L	0.100
200.8	Molybdenum	0.562		ug/L	0.100
200.8	Nickel	< 1.00	U	ug/L	0.500
200.8	Selenium	55.4		ug/L	0.500
200.8	Silver	< 1.00	U	ug/L	0.500
200.8	Thallium	< 1.00	U	ug/L	0.500
200.8	Vanadium	< 2.00	U	ug/L	1.00
2340B	Hardness	116		mg/L	2

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264

Certificate of Analysis

TDF #: DG-264

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID:	SC493_100711	Date / Time Sampled:	10/07/11 09:11	Workorder:	C111002				
EPA Tag No.:	8-B	Matrix:	Surface Water	Lab Number:	C111002-38 A				
Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	47.6	J	ug/L	20.0	1	10/25/2011	SW	1110087
200.7	Calcium	39200		ug/L	100	1	10/25/2011	SW	1110087
200.7	Iron	< 250	U	ug/L	100	1	10/25/2011	SW	1110087
200.7	Magnesium	4350		ug/L	100	1	10/25/2011	SW	1110087
200.7	Manganese	41.7		ug/L	2.00	1	10/25/2011	SW	1110087
200.7	Potassium	614	J	ug/L	250	1	10/25/2011	SW	1110087
200.7	Sodium	3450		ug/L	250	1	10/25/2011	SW	1110087
200.7	Zinc	384		ug/L	10.0	1	10/25/2011	SW	1110087
200.8	Antimony	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Arsenic	12.0		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Barium	119		ug/L	5.00	1	10/25/2011	SW	1110088
200.8	Beryllium	< 0.200	U	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Cadmium	1.73		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Chromium	3.31		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Cobalt	< 0.200	U	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Copper	1.24		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Lead	1.84		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Molybdenum	0.560		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Nickel	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Selenium	53.4		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Silver	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Thallium	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Vanadium	1.03	J	ug/L	1.00	1	10/25/2011	SW	1110088
2340B	Hardness	116		mg/L	2	1	10/25/2011	SW	1110087

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264

Certificate of Analysis

TDF #: DG-264

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID: SC699_100711 EPA Tag No.: 8-B		Date / Time Sampled: Matrix: Surface Water		10/07/11 09:10		Workorder: C111002 Lab Number: C111002-41 A			
Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	43.7	J	ug/L	20.0	1	10/25/2011	SW	1110087
200.7	Calcium	39200		ug/L	100	1	10/25/2011	SW	1110087
200.7	Iron	< 250	U	ug/L	100	1	10/25/2011	SW	1110087
200.7	Magnesium	4330		ug/L	100	1	10/25/2011	SW	1110087
200.7	Manganese	37.2		ug/L	2.00	1	10/25/2011	SW	1110087
200.7	Potassium	578	J	ug/L	250	1	10/25/2011	SW	1110087
200.7	Sodium	3420		ug/L	250	1	10/25/2011	SW	1110087
200.7	Zinc	377		ug/L	10.0	1	10/25/2011	SW	1110087
200.8	Antimony	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Arsenic	11.5		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Barium	120		ug/L	5.00	1	10/25/2011	SW	1110088
200.8	Beryllium	< 0.200	U	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Cadmium	1.74		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Chromium	2.52		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Cobalt	< 0.200	U	ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Copper	1.37		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Lead	1.68		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Molybdenum	0.534		ug/L	0.100	1	10/25/2011	SW	1110088
200.8	Nickel	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Selenium	51.3		ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Silver	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Thallium	< 1.00	U	ug/L	0.500	1	10/25/2011	SW	1110088
200.8	Vanadium	< 2.00	U	ug/L	1.00	1	10/25/2011	SW	1110088
2340B	Hardness	116		mg/L	2	1	10/25/2011	SW	1110087